

THREE RADIOCARBON DATES FOR QUATERNARY MOLLUSCA FROM NORTHLAND

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Abstract. Shells of the warm-water bivalve *Anadara trapezia* (Deshayes), no longer living in New Zealand, have been dated as more than 46,300 years old (Hokianga) and more than 40,100 years old (Marsden Point), thus probably Interglacial in age, and there is no evidence that this species returned during the Holocene after its extinction probably in the Last Glaciation.

Placostylus ambagiosus priscus Powell, the oldest known New Zealand *Placostylus*, from consolidated dune sands near Cape Maria Van Diemen, previously classed as presumably Pleistocene, is dated as 2140 ± 90 years old and is thus considerably younger than previously thought.

This paper records the radiocarbon ages determined for two well-known subfossil molluscs, mainly based on samples from Auckland Museum collections.

Anadara trapezia (Deshayes)

Since it was first recorded from New Zealand by Oliver (1923), the "Sydney Mud Cockle" has been reported in a number of localities on the North Island coast. Crozier (1962) listed 16 New Zealand occurrences, another is added below and there are doubtless still more, unknown to the writers.

A few of the occurrences are in beds classed as Castlecliffian, thus of early Pleistocene Interglacial age, but others are in superficial beds not far above or below present sea level, so that Fleming (1962; see also 1963) suggested a post-glacial date for the occurrences at Kohukohu, Hokianga, described by Powell (1932) and in shallow wells at Marsden Point (see below).

The Marsden Point record is based on juvenile valves associated with a diverse assemblage of more than 30 species of molluscs, cirripedes and brachiopods (N24/602, GS 9151 in N.Z. Geological Survey) obtained from drill cuttings from a depth of 12.2 m, i.e., approximately 0.6 m below sea level in Marsden Point Oil Installation Water Drillhole No. 3, and forwarded for dating by Dr D. Kear, N.Z. Geological Survey (N24/602, GS 9151). It was dated as older than 40,100 years B.P. (Institute of Nuclear Sciences, N.Z. 539).

Following this result, specimens in Auckland Museum from Kohukohu (old mud, collected by E. D. Pritchard between tides, a little to the west of Kohukohu Wharf, including shells with both valves, *in situ*; N14/496) were submitted for dating. They proved to be greater than 46,300 years old (N.Z. 1592).

The Marsden Point and Kohukohu *Anadara*, being warm-water organisms older than 40,000 years, are probably at least as old as Last Interglacial (say 80,000 to 120,000 years old), if not older still, and there is no evidence that any of the other occurrences are post-glacial, i.e. Holocene.

***Placostylus ambagiosus priscus* (Powell)**

The living and extinct forms of the genus *Placostylus* in the far north of Northland (Powell 1938, 1947) include living populations and subfossil populations from consolidated dune sands, occurring with other land molluscs and bird bones representing the fauna of rain forest that was overwhelmed by periodic advances of coastal dunes.

The oldest known *Placostylus*, *P. ambagiosus priscus* (Powell 1938), occurs in consolidated dunes, stained to a pinkish brown hue, in an area surrounding Herangi Trig. Station, 213 m (the 700 ft hill mentioned by Powell 1947). This dune sand, assumed to be Pleistocene from its colouration and consolidation, was mapped as Holocene by Kear & Hay (1961).

Samples of *P. ambagiosus priscus* in Auckland Museum, collected from the type locality (by A. W. B. P.), were carefully cleaned of sand, examined to ensure that no recrystallisation to calcite had taken place, and submitted for dating; the result, 2140 ± 90 years B.P. (N.Z. 1950, new half life, corrected for secular effect) indicates that the sequence of dune advances and the *Placostylus* populations they destroyed are considerably younger than had been thought.

The possibility of any significant error in this result is negligible, since the age has been calculated in relation to the New Zealand land snail standard for Northland (Rafter *et al.* 1972), determined from *Placostylus* collected alive at Spirits Bay in 1946. The isotopic determinations from New Zealand *Placostylus* shell showed no noticeable effect due to assimilation of ancient carbonate into their shells. Moreover, Mr E. J. Cox, Soil Bureau, D.S.I.R., Whangarei, comments (*in litt.* to C.A.F.) that he would not expect shells to survive more than a few tens of thousands of years, since Pleistocene sands are deeply leached. Fire is the most likely cause of the sand dune advance and forest destruction, but what, some 2140 years ago, lit fires is an unanswered question.

Rafter *et al.* (1972: H53-57) published a wide span of apparent ages for *Placostylus* in an archaeological context at Ile des Pines, New Caledonia. A much greater age for a fossil *Placostylus* from the fossil dune sequence at Lord Howe Island was recorded in a paper by Squires (1963, pp. 412-413).

Fossil examples of the endemic land snail, *Placostylus bivaricosus*, which is still living on the island, occurred in a 25.4 mm (12 in.) thick, brown loamy horizon in coral-sand rock, with an overlay of 15.24-24.38 m (50-80 ft) of steeply-dipping, partially lithified, aeolianite sands, representing a relatively undisturbed profile. The age determined for these Lord Howe Island fossils (N.Z. 442) was $27,200 \pm 700$ years but was incorrectly reported as $20,700 \pm 700$ years. (This sample was not examined for assimilation of old carbonate.)

Unfortunately the Herangi *P. ambagiosus priscus* site does not present a profile since it has been subjected to great erosion, almost completely removing the former overlay. Photographs taken in the area between 1902 and 1906, and a Lands and Survey unpublished sketch map made about the same time, indicate that the slopes of Herangi were then already eroded to much the same extent as they are today.

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